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EXAMINER

ENIN-OKUT, EDUE

ART UNIT

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1795

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/558,169

**Applicant(s)**

BASCHEK ET AL.

**Examiner**

Edu E. Enin-Okut

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 July 2008 and 29 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 12-30 is/are pending in the application.
- 4a) Of the above claim(s) 14, 15, 17 and 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12, 13, 16 and 19-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 7/28/08
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**FUEL CELL AND HEATING DEVICE OF A FUEL CELL**

***Detailed Action***

1. The amendments filed on October 24, 2008 were received. Applicant has amended claims 12, 13, 22, 23 and 28-30 and cancelled claims 14, 15, 17 and 18. Claims 12-13, 16, and 19-30 are now pending.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Drawings***

2. The objections to the drawings are withdrawn because amendments made to the drawings address the issues raised in the previous Office Action.

***Claim Objections***

3. Claims 16 and 19 are objected to because of the following informalities: Claim 16 depends upon claim 14 and claim 19 depends from claim 17. Both claim 14 and 17 have been cancelled. Appropriate correction is required. (*Examiner's Note:* For purposes of examination, it is assumed claims 16 and 19 depend from claim 12.)

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claim 12, 28 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

*Regarding claims 12, 28 and 29, the term “essentially” renders the claims indefinite because the claims do not recite the actual shape of the embossing in a manner that is particular and distinct, thereby rendering the scope of the claims unascertainable. See MPEP § 2173.05(d).*

***Claim Rejections - 35 USC § 112***

6. The rejection of claims 13, 15, 18, 21-23, 25, 27 and 30 are withdrawn because claims 13, 22-23 and 30 were amended and claims 15 and 18 were cancelled.

***Claim Rejections - 35 USC § 102***

7. The rejection of claims 12-16, 22-23 and 28 under 35 U.S.C. 102(b) as being anticipated by Mattejat et al. is withdrawn because claims 12, 13, 22-23 and 28 were amended and claims 14-15 were cancelled.

8. The rejection of claims 12-13, 16, 20-23 and 28 under 35 U.S.C. 102(c) as being anticipated by Mizuno is maintained because Applicant did not submit a written translation of the foreign priority document it relies upon to overcome this rejection (see p. 7 of Applicant's Remarks). The rejection is repeated below for convenience.

9. The rejection of claims claim 17-18 under 35 U.S.C. 102(e) as being anticipated by Mizuno is withdrawn because claims 17-18 were cancelled.

10. Claims 12-13, 16 and 28 are rejected under 35 U.S.C. 102(c) as being anticipated by Mizuno (US 2004/0161658).

*Regarding claim 12*, Mizuno discloses a fuel cell [10], comprising a separator [18] disposed between two electrolyte-electrode units [MEA] (Abstract; para. 32, 33, 36; Figs. 3-4), wherein

- the separator is formed from two plates [18A, 18B] each having an essentially rib shaped embossing [grooves, ribs] and touching at contact surfaces (para. 35, 37, 47; Fig. 4), wherein
- a first fluid chamber for a coolant [26] is formed between the two plates and a second fluid chamber [18Ag, 18Ac; 18Bc, 18Bg] for a gas is formed between each plate and the adjacent electrolyte-electrode unit in each case (para. 42, 43; Fig. 4), wherein
- the first fluid chamber for the coolant has two subchambers [26a, 26b] each facing one of the two plates and wherein the coolant can only flow alternately through the two subchambers (Fig. 4).

*Regarding claim 13*, Mizuno discloses that the plates have approximately identical embossings [grooves, ribs] (para. 37, 47; Fig. 4).

*Regarding claim 16*, Mizuno discloses that the embossings of the plates are offset relative to one another (Fig. 4).

*Regarding claim 20-21*, Mizuno discloses that the contact surfaces are gold-plated (para. 52).

*Regarding claims 22-23*, Mizuno discloses that the contact surfaces are distributed approximately uniformly over the surface of the separator (para. 14; Fig. 3).

*Regarding claim 28*, the limitations recited in this claim have been addressed above with respect to claim 12.

***Claim Rejections - 35 USC § 103***

11. The rejection of claims 17-21, 24-27 and 29-30 under 35 U.S.C. 103(a) as being unpatentable over Mattejat et al. in view of Nolscher, Enami, and Yasuo et al. are withdrawn because claim 12, 13, 29 and 30 were amended and claims 17 and 18 were cancelled.

12. Claims 12-13, 16, 19 and 22-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mattejat et al. (US 5,472,801) in view of Nolscher (US 6,080,502) and Enami (JP 10-308,227).

*Regarding claim 12*, Mattejat teaches a fuel cell [fuel cell block 36], comprising a separator [38] disposed between two electrolyte-electrode units [77,80,82,84,77] (Abstract; 6:54-58; Figs. 4-5), wherein

- the separator is formed from two plates [40,42] each having an embossing and touching at contact surfaces (Figs. 4-6), wherein
- a first fluid chamber for a coolant [chamber 72] is formed between the two plates and a second fluid chamber [channels /chambers 74 or 76] for a gas is formed between each plate and the adjacent electrolyte-electrode unit in each case (6:63-7:6; Figs. 4-6), wherein
- the first fluid chamber for the coolant has two subchambers each facing one of the two plates and wherein the coolant can only flow alternately through the two subchambers (7:49-66; Figs. 4-6).

As to the first fluid chamber for the coolant has two subchambers each facing one of the two plates and wherein the coolant can only flow alternately through the two subchambers, one of ordinary skill in the art would readily appreciate that the cross-sectional images of the fuel cell block of Mattejat shown in Figs. 4-6 illustrate the areas where the protuberances make contact with each other. That artisan would appreciate that of the fuel cell block shown in those figures can present an a cross-section similar to that described by Applicant in Fig. 2 of its application when a cross section is take in area other than the one shown by Mattejat.

Mattejat does not expressly teach that the embossings of the plates are essentially rib-shaped.

Nolscher teaches a separator 21 used in a fluid-cooled fuel cell that uses a rectilinear grooves or ducts to move cooling medium through the fuel cell (8:53-9:8; Figs. 4-5).

Further, Enami teaches the creation of coolant flow passages between using adjacent separators 1,2 with projecting parts which are ribbed-shaped, and the separators are disposed upon each other in manner where their primary axes offset, as shown in Figs. 1, 4 (Abstract; Figs. 1, 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilized the ribs, as taught by Nolscher and Enami, as the embossings of Mattejat because Nolscher teaches that the use of a ribbed-shaped projections on separators can facilitate uniformly supplying the entire cell surface with coolant (see Nolscher, Abstract) and, in turn, increase the efficiency of the fuel cell.

*Regarding claim 13*, Mattejat discloses that the plates have at least approximately identical embossings [protuberances] (5:52-57, 7:41-48; Figs. 4-6).

*Regarding claim 16*, Mattejat teaches that the embossings of the plates are offset relative to one another (7:49-66).

*Regarding claim 19*, Enami, discussed above, teaches that the embossings of the plates are rotated relative to one another (Abstract; Figs. 1, 4).

*Regarding claims 22-23*, Mattejat teaches that the contact surfaces are distributed at least approximately uniformly over the surface of the separator (5:53-55; Figs. 4-6).

*Regarding claims 24-27*, Mattejat does not expressly teach that the total surface area of the contact surfaces is at least 10%, or 90%, of the surface area of the separator.

However, one of ordinary skill in the art would appreciate that the separators of Mattejat contacts an electrode-electrolyte unit over an amount, or percentage, of its surface area (see 6:54-58; Figs. 4-6).

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That artisan would also appreciate that the degree of contact of surface area of the separator plates affects the capacity to cool the fuel cell allowing more or less surface area of coolant to flow through.

Thus, one of ordinary skill in the art at the time of the invention would have found it obvious to assemble the fuel cell of Mattejat in a manner where the total surface area of the contact surfaces is at least 10% or 90% of the surface area of its separator as recited in claims 24-25 and 26-27, respectively, to optimize the amount of contact surface that affects the volume of coolant in contact with the separator plate depending on the amount of cooling needed by the fuel cell.

*Regarding claim 28*, the limitations recited in this claim have been addressed above with respect to claim 12.

*Regarding claim 29*, Mattejat teaches a component 38 used in a fuel cell block 36 composed of two plates 40,42 disposed between electrode-electrolyte units (Abstract; 5:34-36, 5:43-48, 6:54-65; Figs. 4-6). The plates form a chamber 72 used to move a coolant 86 through the fuel cell (6:62-66), and, in turn, reduce the cell temperature. The reference also teaches that the component 38 can be used may used not only in a fuel cell block but also in process control apparatuses, such as electrochemical cells, mass transfer equipment, humidifiers and condensers (7:67-8:4).

However, Mattejat does not expressly teach that its component 38 is a heating device.

One of ordinary skill in the art would appreciate that the component 38 of Mattejat cools a fuel cell using the transport of heat from the higher temperature electrode-electrolyte unit to the lower temperature coolant flowing through a chamber formed between plates of component 38. That artisan would also appreciate that: (1) this process can be reversed by flowing a medium through that chamber having a temperature higher than that of the electrode-electrolyte unit; and, (2) the component of Mattejat can be used in another location, such as disposed adjacent to the edge plate of a fuel cell, as evidenced by the alternative uses discussed by Mattejat.



Further, one would appreciate that the two plates 40, 42 of Mattejat, as modified by Nolscher and Enami, have embossing that is essentially rib shaped as discussed above with respect to claim 12.

Therefore, it would have been obvious to that artisan at the time of the invention to use the component of Mattejat, as modified by Nolscher and Enami, as a heating device for a fuel cell because it is well-known in the art to provide heat to fuel cell components to allow the cell to continue to operate under conditions below its normal, ambient operating temperature, or to heat the cell during its start-up.

*Regarding claim 30*, Mattejat teaches a separator [40,42] disposed between two electrolyte-electrode units [80,82,84] (5:64-6:11; Figs. 4-6). The remaining limitations recited in this claim have been addressed above with respect to claims 12 and 29.

13. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mattejat et al., Nolscher and Enami as applied to claims 12-13, 16, 19, 22-30 above, and further in view of Yasuo et al., (US 2002/0187379).

Mattejat, Nolscher and Enami are applied and incorporated herein for the reasons above.

*Regarding claim 20-21*, Mattejat, Nolscher and Enami do not expressly teach that the contact surfaces are gold-plated.

Yasuo teaches separator for a fuel cell a where the surface of the separator is plated with a precious metal, such as gold, platinum, or nickel, that has high corrosion resistance and high conductivity (Abstract; para. 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to plate the contact surfaces of Mattejat, as modified Nolscher and Enami, because Yasuo teaches that this can impart those areas with corrosion resistance and high conductivity.

***Response to Arguments***

14. Applicant's arguments with respect to claims 12-13, 16 and 19-30 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Correspondence / Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Edu E. Enin-Okut** whose telephone number is **571-270-3075**. The examiner can normally be reached on Monday - Thursday, 7 a.m. - 3 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edu E. Enin-Okut/  
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/  
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